

Article

Through the COVID-19 to Prospect Online School Learning: Voices of Students from China, Lebanon, and the US

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Abstract: Online learning has emerged as a widely used learning mode and will likely supplement traditional learning in the post-pandemic era. The purpose of this study is to present student voices of online school education by investigating students' online learning experiences during the COVID-19 pandemic in various contexts, and explain why the impacts are important to student learning and well-being. Semi-structured in-depth interviews were conducted with nine students from China, Lebanon, and the United States to gain direct insight into students' perceptions of each country. The results showed that the online learning environment provided at the national level, such as social conflicts, and the facilities provided at the individual level, such as information access, increase the educational inequity. High-school students experienced numerous psychological changes and encountered academic cheating issues in the home online-learning environment. We recommend that online school education should make significant improvements in pedagogy, students' mental health, and learning assessment, and consider factors beyond technology solutions.

Keywords: online learning; educational equity; education quality; COVID-19; student



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1. Introduction

It is vital to study student perceptions of online learning experiences based on their own reflections. According to UNESCO data report during the COVID-19 pandemic, in mid-April 2020, 1.5 billion children and youth in 195 countries were affected by school closures [1]. Improvements in attitudes towards online learning after the pandemic were found among university students in the US [2]. Due to the fact that online learning has become an optional education delivery for post-pandemic school learning for students at different age levels in various contexts, identifying this evidence can inform the enhancement of students' learning experiences in online learning. It can also inform institutions and policymakers to make accountable planning for the demands of future school education in the digital age.

Online learning has been a trend in education globally since the 1980s. There are several similar concepts such as E-learning, online education, distance education, and digital learning. They refer to an educational model incorporating information and communication technologies (ICTs) into the classroom and students' learning process. As higher education increasingly incorporates online learning [3,4], numerous studies have emerged on the online learning experiences of college students. There are several well-established types of online learning, such as the MOOC, and there are already examples of online learning replacing traditional classroom instruction in higher education and adult education. Many colleges are now providing online undergraduate and graduate degrees. Unlike the practice of online education in the higher education sector, online learning in the K-12 sector is more commonly used as a supplement to traditional school education [5,6]. Online education courses and programs designed for high school students are mostly private, after-school, and voluntary. Also, most online courses for younger students require

parental or adult teaching assistants to participate in supervision. Online learning during the COVID-19 pandemic had several characteristics. First, it was the first large-scale online learning of its kind to be conducted both nationally and globally; second, it was for regular school learning rather than remediation or additional learning after school; and third, it was required of all school teachers and students rather than optional. In this way, the large-scale school learning that was forced to move online during the pandemic gave us an unprecedented opportunity to explore how online learning was implemented.

Although online learning has been promoted as an effective tool to promote education innovation, the empirical evidence of the association with student performance has been limited. An OECD study showed that only providing access to technology makes little impact, particularly for disadvantaged student groups [7]. The research suggested that the area of promise is improving online education quality issues at the K-12 level [8].

Cross-cultural comparisons of students' voices of their online learning experience have been missing. Compared with adults and college students who have prior experience with online classes, high school students have special challenges involving test-focused academic learning for higher education selections. The evidence of non-cognitive online learning conditions in the high school student population is scarce. The learner support strategies of online education, such as teachers' ongoing feedback and social interaction opportunities, have seldom been studied at the high school education level. Research findings of the pandemic increasingly show that vulnerable groups who lack resources, infrastructure, and health care need more support [9]. Students in war-torn countries are among the most vulnerable groups deserving great concern, yet lack the evidence from their own perspectives about the learning and development conditions during COVID-19.

This study is concerned with high-school students' experiences and thoughts on online learning. It investigates diverse groups of students, including those from war-torn, high-protected, and highly infected countries during the pandemic. The investigation of this study has the significance of informing evidence-based online education policy and planning with a focus on inclusion, equity, and quality.

2. Literature Review

2.1. School Closure Policy in Education Emergency Contexts

2.1.1. Remote Learning Challenges for Students

With the closure of schools, all that is related to school education is performed through digital technology, and students have thus lost face-to-face interaction with their teachers and peers. Therefore, students have shown difficulties and stress with the sudden transition to remote learning [10]. The shift from traditional classroom learning to online learning could not happen immediately for both teachers and students. According to Crawford et al., students have been facing challenges such as social isolation, the inadequacy of learning facilities, changing modes of learning, deficiency of lecture recordings in educational institutes, and instability of internet connection in remote areas [11].

2.1.2. The Impact of the Decreased Physical Activities

Countries' "stay at home" orders, lockdown policies, or self-segregation modes have caused people, especially students, to have significantly decreased physical activities [12]. In fact, studies have clearly shown that when students are not at schools, such as during summer vacations and long weekends, they are less physically active and have longer sedentary time or screen time [13]. Research shows that decreased physical activity has an adverse impact on people's mental health and overall well-being [14].

2.1.3. Equity and Ethical Concerns

Online learning profoundly increases equity concerns [15]: not all students have the same access to online learning tools and software. Therefore, providing low-cost technical support and supplemental guidance are also critical for implementing remote and online learning. Moreover, lecture-based classes may be easier to transition from offline instruction

to online courses. In contrast, arts and laboratory-based classes may take more time to shift, posing obvious challenges for students' overall learning experience. However, even with all of these obstacles, online learning is a necessity in the age of the pandemic [15].

In terms of academic honesty and ethics, students have more chances of taking advantage of digital technology to cheat or plagiarize in remote and online learning environments. There are many new ways to cheat in remote classroom assessments and exams: communicating with peers during testing, searching for answers when no one is monitoring, and copying papers online and claiming to be their own work [16].

The huge surge in chegg.com usage during the pandemic may illustrate how online courses may erode student academic integrity. Chegg is an American education technology company that provides students with online academic support services such as answering homework questions, renting books, and tutoring. By the third quarter of 2021, its subscriptions had grown 69% over the previous year to 3.7 million. Its share price has risen 345% since the country began locking down on 18 March 2021 [17]. "The growing number of requests indicates that students are using Chegg for assessment and exam help frequently and in a way that is not considered permissible by universities [18]". According to Forbes' interviews with 52 students from 19 universities including ivy league universities, who used Chegg to study, 91% of them acknowledged using the website to cheat [17].

In such cases, precautions could be applied as well. More testing options, such as randomized assessments or open-book exams using authorized resources, have been adopted to prevent students' communication during testing [19]. However, no assessment test solution for an online course is perfectly practical. For example, although open-book exams tend to assess thinking skills, it may lead students hunting for answers instead of spending time understanding what they have learned [20–22]. As a result, academic honesty and effective assessment pose additional challenges to the quality of online education.

2.2. Online Learning Quality

2.2.1. Pedagogical Choice for Remote Learning

As a result of the global pandemic, countries have been able to experiment with online education and explore new possibilities. Transition to online school learning requires pedagogical and instructional changes to improve students' learning experience in the future of online teaching [4]. Educators aim to carry out a coordinated online pedagogy to ensure students' education quality during the pandemic. For students under special conditions, collaborated global response with shared resources could be reached to target their learning quality [11].

Research shows that the pedagogical solution to online and remote learning is largely based on the available resources of education organizations. Areas with lower technology support often provide non-real-time teaching tools such as recorded sessions, PowerPoints, and Google Classroom, while areas with more developed economies are more likely to offer fulltime online learning platforms such as Zoom and Google meet [11].

The role of the teacher becomes more of a facilitator of learning rather than a direct administrator. This ends up shifting the traditional teacher-controlled classroom environment to a more self-motivated learning experience, which requires students to be more independent with their learning [4].

2.2.2. Student Participation and Engagement

Classroom participation and engagement are two important factors in determining the quality of education. Research results show that online learning may affect students negatively in academics when they do not have a sense of cognitive engagement and social connections [23]. However, that is not everything in determining the learning quality; aspects such as self-motivation in students could also be decisive. Research shows that students who are highly self-motivated or previously have experiences with online learning are at the highest chance of enjoying the benefits and opportunities in an online learning environment [4,15].

In addition, students' learning performance may also improve as they develop an effective, continuous habit during online learning. By cultivating the learning habit, students may attain higher learning efficiency than the traditional face-to-face learning approach [24].

The pandemic has caused an environment that affects many factors related to mental health. Several factors, including social restrictions, lockdowns, closures of schools and businesses, loss of livelihood, decrease in economic activity, and shifting priorities of governments in their effort to control COVID-19 outbreaks can adversely affect the mental health of the population [14,25]. In addition, it is also suggested that the younger population was more affected than the older ones by the pandemic for anxiety disorder and depressive disorder [26].

2.3. Cultural Issues in the Online Classroom

An early study shows that in a cross-cultural context, students have significantly more positive perceptions and higher quality of learning when the classroom allows intercultural communication and peer engagement, in other words, a culturally inclusive environment [27]. However, due to the lack of face-to-face interaction, the approach to cultural inclusion is different in a virtual environment during the pandemic. On the one hand, besides being away from school, a significant number of international students returned to their hometowns with a completely different cultural background from their school education contexts. Statistics show that the total enrollment of international students in the US decreased by 16%, and the enrollment of new international students was down by 43% during the fall semester of 2020 [28]. On the other hand, recent research has shown that online learning during the pandemic widens the gaps between poor students and their better-off peers, with increased drop-off rates among disadvantaged students [29,30].

The drastic global switch to online learning and teaching allowed us to take a closer peek at the feasibility of online education. Online learning will become constrained without consideration for students' many cultures and experiences, posing a risk to student learning and satisfaction [31]. Thus, cultural inclusiveness in online classrooms must also be taken into consideration.

This study aims to investigate students' perceptions of online learning in Chinese, Lebanon, and the US contexts, how they faced the challenges taken by a sudden transition to online schooling, and why the impacts are important to them.

2.4. Research Approach of K-12 Online Education

Research on K-12 online education mainly employs surveys to gauge the effectiveness of online education and its comparison to traditional classroom classes [32], while neglecting students' agency in the education process. Although some studies have addressed the case of online education in high school, they have lacked the adolescents' opinions about online classes based on their own frame of understanding. The global pandemic has brought more attention to online education, with many newly published studies, data presentations of trends, and surveys on online education, but a lack of in-depth inquiry into students' feelings. Thus, the lack of research on students' perceptions has left a research gap in K-12 online education research.

The research on K-12 students' learning experiences and perceptions often involve a complex process, not to mention there are many uncontrollable factors in students' online learning compared to traditional learning in the classroom. On the other hand, the study of students' online educational experiences has to be analyzed from multiple perspectives and in various contexts. None of these issues can be found particularly well referenced in the existing literature.

A systemic and holistic view of online learning from high-school students needs to be explored through qualitative inquiries. Qualitative research often analyzes a relatively small number of individuals or scenarios to maintain the distinctiveness of each of these. Thus, it contributes to comprehending how events, actions, and meanings are influenced by their particular contexts. For example, a case study examines a contemporary event

within its real-world environment, particularly when the boundaries between the object of research and setting are not obvious [33]. The deductive analysis of qualitative data allows researchers to discover the meanings and influences and how they impact a situation-specific phenomenon.

3. Methods

3.1. Contexts

Lebanon, the United States, and China are three countries with varying degrees of socio-economic development, COVID-19 outbreak severity, response measures to the pandemic, and the development of online education.

3.1.1. China

China has 270 million students and nearly 20 million faculty members at all education levels [34]. The government focus of online education has shifted from building infrastructure two decades ago to serving people's needs, especially for those in poor and remote rural areas. Education at different levels in China are predominantly public and are under the unified supervision of the Ministry of Education. Since the outbreak of COVID-19, a uniformed national online education and a high protection measure against the pandemic have been adopted in China. As early as 4 February 2020, China's Ministry of National Education released a "Notification on Supporting Education and Teaching with Information Technology during Epidemic Prevention and Control" to guide the implementation of the "School's Out, But Class's On" online learning policy across the country [5]. According to a nationwide survey in China, 34.1% of participants who experienced quarantine during the COVID-19 outbreak reported at least one depressive, anxious, insomniac, or acute stressful symptom, which is higher than that of those who were not quarantined (27.3%). The results showed that the COVID-19 pandemic and quarantine measures affect mental health negatively [35].

Available online education technologies and teaching resources in China offer the possibility of achieving large-scale online education. As of December 2019, the national platform provided by China's Ministry of Education has created more than 100 million online learning spaces for teachers and students, and these spaces have 38 million active online users each month [34]. Before the COVID-19 pandemic, teachers in China were already proficient in how to use Web 2.0 technologies in their teaching because it was part of a technology-integrated teacher education program attended by pre-service teachers [36]. Research shows that online courses offered to primary and secondary school students in China during the pandemic were still teacher-centered, lecture-based, and mimicked face-to-face learning paradigms [6]. Due to the increasing demands of online education during the pandemic, improvements have been made from management to governance approach, and the social capital has been directed to meet the demands at society, school, family, and student levels.

3.1.2. Lebanon

Both before and during the pandemic, Lebanon has been facing multiple crises in the economy security, health, and the influx of refugees [37]. In particular, the 4 August 2020 explosion at the port of Beirut destroyed an entire neighborhood in the port of Beirut, killing hundreds, injuring thousands, and displacing approximately 300,000 people, greatly exacerbating the dire economic situation of the Lebanese people. [24].

In these circumstances, the government did not and could not prioritize the needs of the education sector. Although the Lebanese Ministry of Education and Higher Education made a request to move to online teaching and learning in March 2020, infrastructure limitations and lack of preparation at all levels had created challenges for schools and educators to suddenly switch to online teaching and learning [38]. According to a survey of 7095 students, parents, and teachers in Lebanon, nearly 70% of schools experienced online learning for the first time during the COVID 19 pandemic, and approximately 60%

of students attended online classes through cell phones [38]. Another survey of 361 new Lebanese university students enrolled during the pandemic showed that Lebanese students seem to be highly motivated to study and succeed in a context of extreme adversity, since university degrees are perceived as a major passport for economic immigration [37].

3.1.3. The United States

Growing social and racial inequality in the United States poses the greatest challenge to education policy makers, educators, and school leaders today to ensure equity in education, especially for students who are themselves from disadvantaged backgrounds [39]. Before the COVID-19 pandemic, enrollment in online education in the United States increased gradually. In the fall of 2019, 37.2% of almost 19.7 million students that enrolled in post-secondary institutions took online courses [40]. By mid-March 2020, almost all educational institutions moved to online instruction [11]. Ninety-three percent of US parents with K-12 children at home reported that their children had some online instruction since the COVID-19 outbreak; however, a third of them reported their children encountered at least one technology-related issue when doing schoolwork [41].

Compared to other countries, the United States has consistently high rates of COVID-19 infection and is one of the most severe. As a result, the online instruction caused by the lockdown lasted for a long time, lasting from March 2020 to September 2021. It was not until the fall of 2021 study that schools opened and returned to offline classes. US researchers and educators are concerned that such a long online education will exacerbate the disparity between students with varying levels of socio-economic status. García & Weiss [30] said, “the pandemic has exacerbated well-documented opportunity gaps that put low-income students at a disadvantage relative to their better-off peers [30]”. The opportunity gaps include access to the resources that enhance learning and development such as technology. Pew Research Center (2021) has shown that parents with lower incomes were most likely to say that their children had to do homework on the cellphone [42].

3.2. Methodology

This study used qualitative methods to capture how student participants perceive the changing world they live in, to understand their situations and judgments, and to capture the complexity of their personal perceptions and experiences [43]. To gain insight into real-life situations, a multiple case study design was used to explore students’ experiences during a special period by asking questions that not only gained information but also stimulated students’ thinking about how they participated in the online classes during the COVID-19 pandemic [44]. Our study performs the same interview protocol for three separate cases, China, Lebanon, and the United States, expecting to obtain similar or contrasting results in different social contexts [33]. Moreover, to accurately capture the complexity of this phenomenon in different contexts, semi-structured in-depth interviews were conducted. Although online learning intersects social, cultural, economic, and educational factors, providing quality online learning for students is a common goal of school education. Therefore, this study adopts a comparative research approach to reveal the essential characteristics of online learning mode in various cultural contexts.

3.3. Participants

In the study, we used multiple case studies to reflect on the diversity of contexts. The cases of identification and selection involved different social backgrounds, the development of online education, and situations surrounding the COVID-19 pandemic in the three contexts. Semi-structured interviews were conducted with nine students from Lebanon, the United States, and China, respectively. Participants were first selected based on convenience, that is, high-school students from different countries that we were able to contact during the global pandemic. In addition, the participants were selected on the basis of the degree of homogeneity and the possibility of participation at the time. For example, students needed have ample time and access to the internet in order to be interviewed and included

in the study. This condition was more difficult to meet, especially for Lebanese students. Of all potential participants, only nine students were able to participate. First, participants were expected to take similar level high-school online classes at home due to the pandemic. Second, participants had to be well-equipped to receive a cross-country online interview of at least 30 min in length and can follow the conversations several times. Third, participants had to be willing to participate in the interviews, in good health, academically excellent in international education programs, and be able to have conversations in English in order to understand the real situation.

After a rigorous selection process, all participants shared the following characteristics: having an international education background, taking an international curriculum, and coming from families of middle- to high-income levels. Three Chinese students studied at international high schools in China. They need to attend online classes teaching in the US because their American teachers went back to the US due to the pandemic. Three American students were studying at private high schools in the United States. Three Lebanon students at high schools were contacted via their siblings who are new college students with internet access. The selection process ensured gender balance. The participants included five females and four males with ages ranging from 16 to 19.

The analysis of the findings of this study was shared with the participants to obtain confirmation, and further sharing with other students when sharing about the online learning experiences for correction and recognition has also triangulated with other students.

3.4. The Role of Researcher

This is an insider's research, as the high-school student is the key researcher and the interviewer. The student researcher has previous training in research methods, international research project experience, and interview experiences, as well as a fluent oral and written language in both English and Chinese. In addition, the researcher was trained prior to the interview and completed the entire study. The study was supervised by a senior researcher with constant feedback during the whole research process. Another researcher also supported data interpretation and provided the triangulation from an outsider's perspective.

As an insider, the researcher established long-term relationships with participants to facilitate their understanding and natural communication during the interview. Since the participants of this study were adolescent high-school students who were not always open to an unfamiliar researcher for an in-depth interview, and may not be psychologically stable during the pandemic, the interview with peers was able to gain the empathy, nuanced understanding, and awareness of an insider from the participant's standpoint [45]. The researcher maintained boundary control by informing participants of the research purpose and keeping a distance from emotional involvement during the interview. The interview was promised to be anonymous to make sure the participants feel safe to express their opinions. Therefore, the student as a researcher gained authentic, in-depth reflections and unique information of the different contexts

3.5. Procedures

At the outset of the study, the authors critically reviewed the existing literature related to both online learning and education in various countries under the COVID-19 pandemic. A deeper insight into the promises and issues of online learning from the literature helped the authors prepare for the semi-structured interviews. We set up a generic structure for the interviews by deciding in advance the main questions. The interview questions were divided into two parts. The first part asked about the brief introduction of the participant and their online learning environment and experiences. The second part of the interview asked participants to talk about topics including challenges and quality of online learning and teaching, adaptive behavioral characteristics, and the most significant impacts of the online learning experience during the COVID-19. More detailed questions were asked if other topics emerged during the interviews.

One of the researchers conducted interviews with the participants to obtain data on students' perceptions of their online learning experiences during the pandemic. All interviews were done through Zoom, Facetime, or phone calls based on participants' first convenience due to the pandemic and other factors. Each interview lasted for 60 to 90 min, depending on the participant. When inviting the participants, the purpose of the research was clearly explained. We used pseudonyms to protect the identity and confidentiality of all participants.

3.6. Data Analysis

Answers from each participant were analyzed qualitatively. All interviews were recorded using a digital recorder, and the interviewer took notes during the interviews. All interviews were transcribed verbatim. Then, we started by exploring the interview data to see what main themes would emerge. We first carefully examined all the transcripts from the interviews that had similar meanings and then coded them as different themes by different countries as a category. We used an inductive approach when coding the data. Finally, agreement was reached among the coders.

4. Results

4.1. Students' Views of Online Learning in the COVID-19 Pandemic

4.1.1. Educational Inequity

Although interview participants in all three countries had digital technology devices that could be used for online learning, they expressed various levels of satisfaction with the infrastructure that ensures the online courses run smoothly. Students in the United States were very satisfied with good Wi-Fi connectivity, facilities, and available resources.

"I have a laptop and phone to support my learning; I also have additional devices such as iPad and printer; (how is the internet connection in your area on a scale from 1–10?) I would say 8; I rarely experience any lagging in the video quality."

(US_M1_072021)

Chinese students reported having enough electronic devices to study online, but students were occasionally forced to use VPN connections with unstable signals to access information and materials on certain well-known foreign websites such as Google.

"I have my iPad, laptop, phone, and printer that supports my learning; the internet connection is also pretty good; however, YouTube and Google were banned in China as I learn international courses, there were many resources I cannot access, for example, I missed many live streams on YouTube; the connection for resources abroad using VPN was very poor, I need to switch many different VPN when there's no connection."

(CN_F2_072021)

However, students in Lebanon experienced poor internet connectivity due to social instability, among other reasons. Participants mentioned that not all families in Lebanon have enough electronic devices to support their children's learning through the Internet.

"I experience lagging in the video quality very often; (on a scale from 1–10) I would say 4; I think I am more privileged than other Lebanese because I have my own device and I can afford WIFI. Most Lebanese found online learning really hard because not everyone can afford WIFI/electricity with the political and economic crisis in our country; and most families only have one laptop for the oldest child."

(LN_F1_072021)

4.1.2. Ethical Issues

During interviews, students reported an increased likelihood of cheating during online learning. Various ways of cheating were observed and, in some cases, developed into a chain of interest.

“One way to cheat is to put their studying materials outside of camera view or use voice-controlled electronic device (like Siri) to cheat during online tests.”

(LN_F_072021)

In addition, during online courses, as teachers change the way they examine students from exams to essays or projects, students can do so by copying information directly from the Internet without their own insights. Even, there are students who have their papers written for them by paying someone else to write them.

“There was a person in my class that copied his whole essay from the Internet; he also pays other people to write his homework for him and got A’s. The teacher did not know that since we are not in-person.”

(US_M_072021)

“People who profited from the act of academic dishonesty continued to build their system towards further profit. For example, small “companies” or part-time jobs that earn money by taking exams and writing essays for students. This chain of profits lasted and even grew larger in size after online learning.”

(US&CN_M_092021)

We observed that high-school students were being followed by essay-writers on social media after school reopening. The chain of profit of academic dishonesty took the initiative to lure students and gained more popularity. It is worth noting that the cancellation of exams due to online education during the pandemic also affected many students who wanted to prove their level of learning through test scores.

4.2. Students’ Mental Health in the Online Learning Environment

4.2.1. Mental Health Condition

From the interview, students mentioned that their mental health and overall well-being were unstable during online learning. Multiple causes contributed to students’ unstable mental health condition: The lack of human connections and exercise is most mentioned by the participants; moreover, students experienced a lack of satisfaction in life and learning. However, the responses were different in three different contexts.

Students in the US got tired of the repetitive online learning experience and started to value self-care day as a time to put their life back together and destress. Self-care days mainly involve relaxing activities such as taking a bath, cleaning their room, enjoying a movie with snacks and face masks, etc.

“I would spend a night or a weekend just relaxing to get my life back together.”

(US_F1_092021)

Instead of doing destressing activities, student participants in China gave themselves time to feel depressed. They listened to blue music late at night that amplified their stress and depressed emotions and named the music app “internet depression cloud”. For Chinese students, music is a way for them to express their stress.

“I would listen to music when I cannot go to sleep at night and let my thoughts flow with the music.”

(CN_M1_072021)

With a less equipped environment, the Lebanese students chose to spend more time sleeping. The Lebanese participants mentioned that often times they experienced social upheavals during their learning, and the internet connection could be lost for several days. In this case, where they do not have the opportunity to learn, they would go back to sleep as they believe it would clear out their mind.

“Sometimes I wake up and the internet isn’t working, I would go back to my bed and sleep the whole day, because I don’t want to hear about the social crisis out there.”

(LN_F_072021)

Aside from the negative emotions, students also make positive adaptations during the pandemic. Participants mentioned that support from family and friends plays a vital role in helping them adjust their moods. Some participants would go out to nature to get some fresh air and try not to be in front of a screen the whole day. It is also worth noting that students believe they have significant self-growth in their mental state, which prepares them to be ready to face challenges in the future.

4.2.2. The Wax and Wane of Social Connection and Self-Development

The social connection was one of the most frequently mentioned words in the survey. Participants reported that there was a lack of communication with teachers when they encountered questions, a lack of instant feedback in class, and it was hard to find effective ways to communicate after class. Some teachers chose to give out class recordings instead of teaching on Zoom, which resulted in students spending extra time on review. Moreover, learning over the Internet did not provide students with enough hands-on learning opportunities or group discussion time. Therefore, many students chose to find resources online by themselves as the learning quality in class was insufficient for them to understand the subject, thus improving their independent learning ability.

"Many times I feel difficult to communicate with teachers in class, and I always have to open the microphone and then suddenly talk. This is so different from the classroom . . . There is no informal communication outside of class, unlike in the past when I could talk to the teacher at school."

(CN_F1_072021)

"We seem to have lost our social connections, both with classmates and with friends. There is very little group work in class . . . it was the best way for us to make friends and get to know each other."

(US_M_092021)

Participants expressed that they gained an opportunity for personality development, self-cognition, and independent living skill. Due to the pandemic, students were not able to hang out with friends or have face-to-face communication. Most of their time was spent at home in front of electronic devices. During the pandemic, many students discovered their passion and hobbies, as well as what kind of life they wanted to experience when they grew up. By spending lots of time at home, students also developed life skills that would provide them with support when living independently, such as cooking, fixing broken furniture, weeding, etc.

"If you ask me what I'm doing with the time I used to spend socially, one of the more positive things is that I have more time to spend with myself."

(US_M_072021)

5. Discussion

The change of learning mode at the school level demands educational institutions engage students successfully. As the ecological system theory presented, the individual development of each student is affected by each layer of the system. Students' education process is affected by the relations between environment settings and by the larger contexts in which the settings are embedded [46]. The education policies towards the pandemic are macro-system changes, which led to the adoption of online teaching in the mesosystem. Following the meso-system change, the shift from offline teaching and learning to online affects how to learn and how to evaluate learning, and has had an impact on student's academic performances, psychological development, and interpersonal relationships. The micro-system changes, in turn, added to social equity and ethical issues in the macro-system.

Along with the pandemic, online learning is a transformative dynamic in which information technology, educational system policies, and economic forces intertwine to have a systemic impact on student development. Thus, attention should be paid to students'

perceptions of their actual experiences as reflections. In our study, students' various voices across countries reflect the impact of global public emergencies on various cultural contexts. By comparing the online learning of students in different countries, we are able to see how the interactions at different system levels influence each other, especially the social equity and security, ethical issues in assessment, pedagogy of school learning, family facilities and support, and mental health influences on a student. It is worth noting that gender differences were not evident in our study; background differences outweighed differences in gender behavior patterns.

5.1. *The Impact of Online Learning Environments on Adolescent Student Wellbeing*

This study revealed that loneliness and isolation were the most frequently cited psychological states associated with online home classes during the COVID-19 pandemic by the participants. Moreover, it is found that emotional stress such as depression and anxiety disorder may ensue even when schools get reopened after the pandemic [47]. Development psychology about adolescents and mental health research on post-pandemic effects show that teenagers are more vulnerable to stress, depression, and anxiety symptoms, although they may not yet meet the criteria for developing Post-Traumatic Stress Disorder (PTSD). Our study explores the impact of changes in the learning environment on high-school students due to the global pandemic, a social change. The special nature of adolescents is reflected in the interrelationship between the dramatic individual changes during adolescence and the changes in the social environment, which leads to a high incidence of mental depression and the demand for adolescent wellbeing [48–50]. According to a survey of more than 110,000 K-12 students in China who took online classes during the pandemic, grade level had the greatest impact on how they perceived online learning. High-school students interpreted online education in the most negative way, with a tendency to believe it was difficult and ineffective [6]. Therefore, it is necessary to take into account the characteristics of this age group of students in the discussion of online school learning.

Moreover, the current online class pattern lacks the interactions and collaboration between teachers and students and the sense of classroom participation that makes the course difficult for students compared to the offline course model. Indeed, engagement is a central limitation of online learning. The lack of student engagement and prolonged screen time in the online learning environment results in students' isolation, passive learning, and even dropping out [51]. Therefore, it is recommended that the government and schools make efforts to assist students' psychological well-being when online learning is running as the main way to deliver school learning [25].

García & Weiss [30] expressed the idea that the "whole-child" development that occurs in a school environment cannot be accomplished through online school learning because going to school is not just about learning reading and math but also about developing non-cognitive skills. From the results of this study, it is undeniable that online learning brings many positive effects to students by leaving time and opportunities for self-development, self-regulation, self-care, as well as family support. For example, the increased independence and self-learning ability of students that we saw in our results. However, individual incidental development is no substitute for systematic and comprehensive schooling. Therefore, in terms of the current pattern, effective online learning should consider young people's psychological well-being and interpersonal connections.

5.2. *Ethical Issues Facing Students in Online Learning*

5.2.1. *The Human Value Risk in Online Learning Benefits*

Mass online learning has not given enough attention to using trustworthy ICTs. The ethical issues mentioned by the students in this study are most problematic in online learning courses. Research confirms that cheating took place in online courses [52], especially during the COVID pandemic. ProctorU, an online proctoring service that allows students to complete exams at home, reported that because the pandemic forced millions of students online, virtual cheating rose to an unprecedented level [53]. Researchers have

related it to student anxiety, family engagement, or physical health factors during the pandemic, whereas this study reveals the booming digital business on technological market platforms [54]. The education services and meritocracy gains would be harmful to human values if it makes students more likely to cheat on assignments and tests without assuming their responsibility.

5.2.2. Effective Assessment Methods

To address the issue of student academic ethics raised by online courses, researchers have tentatively proposed two approaches, introducing online proctoring and increasing assessment frequency [52,53]. The former is not the best approach because a game of hiding and seeking between students and proctors would not support the goal of learning. The latter focuses on how students are assessed in the online education model. It has been mentioned that low-stakes assessment instead of one or two summative exams can reduce students' academic dishonesty because the lower-stakes environment reduces students' exam stress [53,54].

However, it needs to be cautious, as the technical solutions on assessment per se may not be the approach to targeting ethical values. In addition, these above solutions and suggestions seem reasonable; they have not been tested by empirical evidence yet. Most of the literature and research on cheating in online education has been specific to higher education levels or adult education. Therefore, whether these findings and suggested improvements can be applied to the study of ethical issues in online learning for high school students deserves further discussion and validation. This study identified similar academic and ethical issues. It also shows the urgency of setting ethical standards and values for the high school online education agenda.

5.3. The Pedagogical Implication from Students' Perspectives

Both previous studies on online education and the online learning experiences of the high school students involved in this study during the pandemic suggest that online classes are definitely more than simply replicating face-to-face instruction over the Internet. The issues that emerged from this study regarding declining student engagement and the arising psychological issues point to the potential for pedagogical improvements in online education. Online education should be revised in terms of pedagogy, support model, and curriculum [53].

It has to be acknowledged that lack of engagement is a persistent issue for online learning, resulting in poor results and retention [55]. Hrastinski [56] extended the theory of online learning as online participation, concluding that participation needs to be enhanced to improve online. However, students' participation does not necessarily mean engagement. Online learning often lacks the opportunity for students to interact with peers or teachers in face-to-face classes, so online education should be deliberately designed to increase interactivity both in and out of class. After all, learning is a result of social interaction.

"Social learning theory approaches the explanation of human behavior in terms of a continuous reciprocal interaction between cognitive, behavioral, and environmental determinants" [57] (p.vii). Today, with the Internet, Web 2.0 technology, and social media influencing classroom learning and radically transforming the learning environment, some instructors continue to utilize this theory to illustrate how digital technology is used in teaching and learning [58]. Hill et al., [59] explored how social learning theory can be applied in the design, development, and implementation of online learning environments, arguing that human interactions within such environments help to initiate, sustain, and support associated learning processes.

5.4. Intersecting Resistance in Digital Educational Equity

Through in-depth interviews with high-school students in three different countries, the most obvious issue that emerged was the impact of the digital divide on students' online school learning. The digital divide concept has been around since the day digital

technology was created, referring to electronic devices, and now due to the addition of online school learning, the digital divide has to be added to the network connectivity [53].

Consistent with the equity studies on digital device and network connectivity, this study shows that the disparity of family income and social status determines the gap in students' accessibility to educational technology, which becomes more prominent in the context of online school learning. For example, a US survey showed that parents with lower incomes were more likely to say their children faced technology-related obstacles during the pandemic [41]. In our study, Lebanon students said they had to share devices with their siblings because of the limited availability of online learning devices in a home environment.

In addition to the previous studies of online technological solutions [49], the findings of this study reveal the effectiveness and the equity of online education, especially when we refer to online school learning, are beyond internet connectivity and involve intersecting resistance. Firstly, based on the results of various cultural contexts, this study shows that social stability and transparency contribute to the realization of online learning and ensure educational equity. As mentioned, in Lebanon, it was difficult for the government to prioritize education due to the peace issue in the country. Students perceive safety at home during quarantine, although the quality of students' online education was severely affected during the pandemic. Secondly, a stable Internet connection is not equivalent to equal information availability, let alone the educational equity of online learning. In China, students found difficulties accessing international websites for online learning, as the information available and language provided by digital platforms and operations are different across countries. Thirdly, an equitable online education environment happens with cultural inclusivity. The lack of multicultural reading content and communication problems pose a culturally inequitable online learning environment for students [60].

When doing comparative education research at the country level, it is important to realize that education in each country is multilevel. The three countries covered in this study vary greatly in their internal levels of education. Therefore, it is important to note that the students in this study came from privileged or well-off middle-class families in their respective countries. They are selected as they have the Internet to take online classes, while there are millions of children and youth, who have no access to technology, lack basic literacy, or out of school, not yet be included in developing digital competence, and have been voiceless in online learning.

6. Conclusions

This study adds to the existing research literature on high school student voices about their feelings and perceptions of studying online during the pandemic. The COVID-19 pandemic is the most severe disruption to global education in history. This study discusses the effectiveness of online school education by comparing the circumstances in which online education occurs in different contexts.

We argue that the development of students' learning outcomes cannot be separated from student well-being and the social context in which they live, such as the social conflicts that impact the educational experience of young students. Research focusing on this topic should aim to reconsider the systemic impacts of various education components and regards adolescents as active learners rather than considering some education elements independently. From a socio-ecosystem perspective, changes in the macro system's policy toward the school as a mesosystem also indirectly affect each student. In addition to the single measure of learning outcomes, the psychological issues of students and the ethical issues involved in the assessment of outcomes are factors that need to be considered when effective online learning is implemented. In addition to the inequities in online education brought about by internet connectivity, a stable social environment, equal availability of information, and cultural inclusivity in online classrooms are all important components in ensuring online education equity and bridging the digital divide.

7. Limitations and Future Research

One of the limitations of this study is that the results are not sufficient to describe online education within a country during the pandemic and do not support generalization. This study presents the realities by having students' voices emerge through peer conversations and provides valid interpretations of the most important impacts of online learning on student life. Although students in different contexts show some typical online learning needs and conditions, the findings are not adequate to illustrate the online education landscape of the research scope during the pandemic.

This study's investigations of students' authentic voices about online learning in different countries can serve as a starting point for future research. Future research on online school learning for high-school students can involve more comparative studies to provide empirical evidence with generalizable conclusions. Research on online education in a particular country should collect more balanced and stratified samples for an overall picture. Furthermore, intersectional issues should be explored as this study shows that more issues are involved beyond technical solutions of connectivity and academic attainment. To improve the quality of inclusive education, more studies are needed on the needs and impacts of online school learning as well as the issues transforming education in different contexts in the post-pandemic era.

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